BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.

What Is Claimed

1. A reciprocating piston motor comprising:

a piston-cylinder assembly, wherein each piston has linear reciprocal motion in an associated cylinder;

a first intermediate shaft having a first rotational axis;

a first connecting means kinematically connecting said first shaft to each said piston so that said first shaft has a rotary oscillating motion around the first rotational axis in synchronism with the linear reciprocal motion of each said piston;

an output crankshaft that includes a second shaft rotatable around a second axis, and a single crank pin offset from said second axis; and

a second connecting means kinematically connecting said first shaft to said single crank pin so that oscillating motion of said first shaft is translated into continuous one way rotation of the crankshaft around said second axis.

2. The motor of claim 1, wherein each aid piston has a predetermined stroke travel distance;

said crank pin being located on a third axis that is offset from the second shaft rotational axis by a distance that approximately equals the piston stroke travel distance, whereby said crankshaft expereiences one revolution for each piston reciprocal motion.

3. The motor of claim 2, wherein said crankshaft has a counter weight located on an imaginary line extending through the second shaft axis and the crank pin axis.

4. The motor of claim 1, wherein said first connecting means comprises a toothed rack means joined to said pistons, and a toothed gear means carried by said first shaft in mesh with said rack means.

5. The motor of claim 4, wherein said piston-cylinder assembly comprises two aligned pistons having linear reciprocal motion on a common axis;

said toothed rack means comprising a toothed rack extending between said aligned pistons, said toothed gear means comprising a toothed gear carried by said first shaft in mesh with said toothed rack.

6. The motor of claim 1, wherein said first connecting means comprises a swingable link means pivotably joined to said pistons, and a lever means carried by said first shaft; said lever means being pivotably connected to said link means, whereby said first shaft has rotary oscillating motion around the first rotational axis.

7. The motor of claim 6, wherein said piston-cylinder assembly comprises two aligned pistons having linear reciprocal motion on a common axis, and a rigid bar connecting said aligned pistons for conjoint movement; said swingable link means being pivotably joined to said rigid bar.

8. The motor of claim 6, wherein said piston-cylinder assembly comprises two pistons movable linearly on two parallel axes; said swingable link means comprising two separate links pivotably joined to the respective pistons; said lever means comprising a lever having a central area thereof joined to said first shaft and end areas thereof pivotably connected to the respective links.

9. The motor of claim 8, wherein said second connecting means comprises of single connecting rod having pivotal connections to said lever and said crank pin.

10. The motor of claim 1, wherein said second connecting means comprises a single sector gear carried by said first shaft, single linearly movable toothed rack in mesh with said sector gear and a connecting rod having pivotable connections with said toothed rack and said crank pin.

11. The motor of claim 1, wherein said piston-cylinder assembly comprises two aligned pistons having linear reciprocal motion on a common axis, and a rigid bar connecting said aligned pistons for conjoint movement; each piston having a predetermined stroke travel distance;

said first connecting means comprising a first toothed rack on said rigid bar, and a toothed gear carried by said first shaft in mesh with said toothed rack;

said second connecting means comprising a sector gear carried by said first shaft, a

second toothed rack in mesh with said sector gear, and a connecting rod having pivotal connections with said second toothed rack and said crank pin;

said crank pin being located on a third axis that is offset from the second shaft rotational axis by a distance that approximately equals the piston stroke travel distance, whereby said crankshaft experiences one revolution for each piston reciprocal motion.

12. The motor of claim 1, wherein said piston-cylinder assembly comprises two aligned pistons having linear reciprocal motion on a common axis, and a rigid bar connecting said aligned pistons for conjoint movement; each piston having a predetermined stroke travel distance;

said first connecting means comprising a swingable link pivotably joined to said rigid bar, and a first lever carried by said first shaft, said lever being pivotably connected to said link, whereby said first shaft has rotary oscillating motion around the first rotatonal axis;

said second connecting means comprising a second lever carried by said first shaft, and a connecting rod having pivotal connections to said second lever and said crank pin;

said crank pin being located on a third axis that is offset from the second shaft rotatonal axis by a distance that equals the piston stroke travel distance, whereby

said crankshaft experiences one revolution for each pistol reciprocal motion.

13. The motor of claim 1, wherein said piston-cylinder assembly comprises two pistons movable linearly on two parallel axes; each piston having a predetermined stroke travel distance;

said first connecting means comprising two separate links pivotably joined to the respective pistons; and a lever having a central area thereof joined to said first shaft and end areas thereof pivotably connected to the respective links, whereby said first shaft has rotary oscillating motion around the first rotational axis;

said second connecting means comprising a connecting rod having pivotal connections to said lever and said crank pin;

said crank pin being located on a third axis that is offset from the second shaft rotational axis by a distance that approximately equals the piston stroke travel distance, whereby said crankshaft experiences one revolution for each piston reciprocal motion.

14. The motor of claim 1, wherein said piston-cylinder assembly comprises at least four Individual pistons;

Said first connecting means comprising at least fur separate drive systems;
said second connecting means comprising a single drive mechanism for transmitting a drive force from said first shaft to said crank pin.

15. The motor of claim 14, wherein each said drive system comprises a swingable link connected to one of said pistons, and a lever carried by said first shaft; each lever having a pivotal connection with an associated link.

16. The motor of claim 14, wherein said single drive mechanism comprises a single sector gear carried by said first shaft, a linearly movable toothed rack in mesh with said sector gear, and a connecting rod trained between said toothed rack and said single crank pin.

17. The motor of claim 14, wherein said single drive mechanism comprises a single connecting rod having separate pivotal connections with said first shaft and said crank pin.